ISS and Human Research Project Office Highlights
March 19, 2010

ISS Research Program

MDCA/FLEX completes three tests points on ISS.

Multi-use Droplet Combustion Apparatus' Flame Extinguishment Experiment (MDCA/FLEX) achieved three successful test points on March 11, 2010. The first droplet ignited without need of a support fiber, and extinguished with no oscillations. This is indicative of radiative extinction. A vapor cloud formed several seconds after flame extinction with a large ring (possibly soot or vapor) away from the droplet. This test will help the investigators understand post-extinction droplet/ambient behavior.

The second droplet ignited with a support fiber then translated along the fiber. There appeared to be some interesting soot dynamics associated with the start and stop of the translation. The ignited droplet also formed a large cloud after visible flame extinction.

An unplanned test was executed with a smaller droplet size critical for determining the radiative quench branch of the flammability map. This test together with the first test clearly shows the radiative quench branch for heptane in this ambient condition.

MDCA/FLEX operations for the week of March 15, 2010 include image downlink operations, Fuel and Oxidizer Management Assembly (FOMA) operations, and capture of four test points beginning mid-week. Increment 23/24 starts 19 March 19, 2010. (POC: MAH/J. Mark Hickman, (216) 977-7105)

FLEX-2 completes drop-tower testing of beaded fiber.

In drop tower verification testing of the beaded fiber used for the binary droplet array tests, nucleation at the bead/fiber interface occurred for Flame Extinguishment Experiment-2 (FLEX-2). To ameliorate this effect, a new 80-micron fiber with a 150-micron steel bead will be sputter coated with a 2-micron coating of silicon carbide (SiC). This has put the project a little over a week behind the planned schedule. There is a risk that the beaded fibers may not be ready for shipment the week of 3 May 2010. Several mitigations are being considered including simultaneous sputtering of multiple beaded fibers and asking for relief on the ship date. (POC: MAH/J. Mark Hickman, (216) 977-7105)

FIR/LMM scheduled for Power and Checkout Operations on ISS.

Astronaut T.J. Creamer selected installing the 30mm Pentane Constrained Vapor Bubble (CVB) Module for his voluntary science activity on International Space Station (ISS), this Saturday March 20, 2010. The Fluid Integrated Rack (FIR) and the Light Microscopy Module (LMM) are scheduled to power up on ISS on March 22, 2010. CVB will be alignment and performed testing on March 22, 2010. (POCs: RET/David F. Chao, 3-8320, MAH/Ronald Sicker, 3-6498).

SAME-R Systems Requirements/Design Review Plan has been written.

Smoke Aerosol Measurement Experiment-Relfight (SAME-R) plan for the Systems Requirement/Design Review has been written and is in signature cycle. The technical review kickoff is scheduled for March 19, 2010 with the main review scheduled for 26 March. Deborah Niemira is the review Chair. (POC: J. Mark Hickman, (216) 977-7105)

Human Research Program

Dynamic Measurements Group visits GRC for seminar

The GRC Exercise Countermeasures Project (ECP) Manager hosted a dinner seminar and a tour of the Exercise Countermeasures Lab for 22 visitors from the Dynamic Measurements Group (of northeastern Ohio) on March 10, 2010. The seminar focused on dynamic measurement applications and sensors development for ECP, including accelerometry for activity monitoring during EVA, and a novel force sensor currently being used on the International Space Station in the Harness Station Development Test Objective. (POC: MAH/Gail Perusek (216) 433-8729)